Space Weather Forecast

Issued on Sunday, 22 September 2024 at 01:19 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of Moderate flares (R1/R2 Radio Blackouts) throughout. Chance of Active to G1/Minor Geomagnetic Storm intervals 24-25 Sep.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Low with only occasional Common class flares observed, the largest from a region just west of the north-centre disc. There are currently eight sunspot regions on the Earth-facing disc. The largest region remains a slightly complex region in the southeast disc. Two regions in the northwest, close to centre disc, saw the most notable growth and maturation during the past 24 hours. One of these regions retains a small mixed polarity spot on the lead spot within the sunspot group. A further region in the southwest disc, which was the source of a Strong flare on 14 Sep, continues to decline. The other regions are either small, simple or both.

No Earth-directed CMEs (coronal mass ejections) were observed. However, a filament disruption and lift-off from the southern disc around 21/1930UTC may have produced a small CME and awaits coronagraph imagery for confirmation.

Solar Wind / Geomagnetic Activity: Generally slow wind conditions persisted. Solar wind speeds eased around 21/0900 UTC from Slightly Elevated to be at background, from 420 km/s to near 350km/s. Winds then saw a slight uptick around 21/1800 UTC returning to Slightly Elevated levels and are currently around 400-420 km/s. The Interplanetary Magnetic Field was weak throughout, with the important north-south component fluctuating between being weakly northward and southward directed. Geomagnetic activity was Quiet (Kp 1-2).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) remained at background.

Four-Day Space Weather Forecast Summary

Solar Activity: Low to Moderate activity is expected, with a chance of isolated Moderate-class flares. At least one new or returning region is expected to rotate onto the disc by Day 2 (23 Sep). This is supported by brightness close to the limb on SDO/AIA-0094 imagery and helioseismic analysis of the far-side.

Solar Wind / Geomagnetic Activity: No Earth-directed Coronal Mass Ejections (CMEs) currently feature in the forecast. Slight chance of a weak enhancement during Day 1 (22 Sep) from any interaction with the faster solar winds from a narrow coronal hole in the northwest. Further enhancement then expected from late on Day 3 (24 Sep) associated with another fast wind enhancement from a larger and more strongly defined coronal hole, currently near centre disc. The net results is for winds to largely remain at, or close to, background levels before increasing towards the end of the period to around 500 km/s.
Mainly Quiet activity forecast (Kp 0-2) with isolated Unsettled (Kp 3) intervals. Any onset of the fast winds towards the end of Day 3 and during Day 4 (25 Sep) will bring the chance of Active (Kp 4) intervals and a chance of G1/Minor Geomagnetic Storm intervals (Kp 5).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is forecast to be at background with no solar radiation storms occurring.

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	5	5	20	30
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	40	40	40	50
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	5	5	5
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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